

III.—*On the Taxonomy of the Swifts and Humming-birds : a Rejoinder.* By Dr. R. W. SHUFELDT, C.M.Z.S.

IT is with no small degree of interest, and with a considerable degree of profit, that I have read Mr. Lucas's recent article on the classification of the Swifts and Humming-birds*. And, coming as it does from the pen of a scientific avian osteologist as a criticism of an article of mine on the same subject†, it is especially valuable, and more than worthy of careful consideration. Some of his objections to my views I believe I have already answered in another place‡; while much that I put forth in support of my convictions in 'The Ibis' last January he has thus far failed to meet. Believing, as we must, that this matter, when settled, will be settled by the weight of biological facts and not by the weight of authority, it would seem nevertheless that my critic is entitled to a brief reply to his question as to "precisely who, among ornithologists, have accepted his [my] conclusions that the Swifts are practically Swallows and have no relations with the Humming-birds" (*op. cit.* p. 365).

In the first place, Dr. Shufeldt does not believe that the "Swifts are practically Swallows"; but, on the other hand, he does believe that those two groups are derived from a common ancestral stock§, and that the Swifts are not especially related to the Humming-birds. It seems to me that that statement is clear enough. Next as to my "persistently misquoting" Professor Huxley's views in the premises: not exactly misquoting him, as Mr. Lucas says, but using his words "to convey a false impression." Upon more occasions than one I have distinctly named the groups of birds that Huxley included in his "Cypselomorphæ," and claimed that it "was done upon only too few characters, and mainly based upon the osteological ones seen at the base of the skull"||. That can hardly be termed a "most unfair kind

* 'The Ibis,' 1893, pp. 365-371.

† *Ibid.* pp. 84-100.

‡ 'The American Naturalist,' 1893, pp. 367-371.

§ Journ. Linn. Soc., Zool. xx. p. 390.

|| Amer. Nat., April 1893, p. 370.

of misquotation," as Mr. Lucas has termed it (p. 365, footnote). What I say here now about Professor Huxley's statements will not be hereafter considered in the light of a misquotation, I am very sure. In his famous contribution to the "Classification of Birds" in the P. Z. S. of April 11, 1867, he has first seriously to deal with the Swallows, Swifts, Goatsuckers, and Humming-birds on pp. 452-454 inclusive. The first statement he makes is that "the Swallows completely agree with the other Passerine birds in the general form and arrangement of the bones which enter into the composition of their palates" (p. 452). That is practically true, and it is a very good point to offer as an initial argument. He immediately follows that statement by saying:—"And the Swifts essentially resemble the Swallows, though the form and proportions of the palatine bones are somewhat different" [and to prove it he refers to his figure of *C. apus*, fig. 34]. This statement is equally true, and the only remarkable part of it is that he makes the comparison between the Swifts and the Swallows, and *not* with the Swifts and the Humming-birds. Omitting now what he says about the Swifts and *Caprimulgus* and its allies in the next three paragraphs, we find him first referring to *Trochilus* on p. 454, but *not* comparing its palate with a Swift—simply stating that "*Trochilus* has the true Passerine vomer, with its broad and truncated anterior and deeply cleft posterior end. I have not yet been able to obtain a perfectly satisfactory view of the structure and arrangement of the palatine bones in the Humming-birds." As both Parker and I myself have pointed out for him, Professor Huxley was entirely wrong about the vomer in the *Trochili*, for every avian anatomist now knows quite well that the vomer of a Humming-bird is of an entirely different structure from the same bone in a Swift.

Following him along, the next paragraph that touches upon the subject under consideration is on p. 456; and there Professor Huxley simply states, what is very true, that "in their cranial characters the Swifts are far more closely allied with the Swallows than with any of the desmo-

gnathous birds, the Swift presenting but a very slight modification of the true Passerine type exhibited by the Swallow. No distinction can be based upon the proportions of the regions of the fore limb; since in all the Swallows which I have examined the manus and the antebrachium, respectively, greatly exceed the humerus in length, though the excess is not so great as in *Cypselus*." This is actually all that occurs on these points in the *descriptive part* of his memoir. There is not a *single* comparison between a Swift and a Humming-bird, but only a gross error in the matter of the morphology of the vomer in *Trochilus*; added to this, we have several favourable comparisons between Swifts and Swallows.

With this kind of information, Professor Huxley carries us on to the *taxonomical part* of his memoir. The group that interests us here is found upon pp. 468 and 469—the *Cypselomorphæ*, which he claims "contains three very distinct families—the *Trochilidæ*, the *Cypselidæ*, and the *Caprimulgidæ*." The meagre list of characters upon which these families are arranged do not exist as Huxley says they do, or thinks they do. In the first place, *Trochilus* has a slender *spine-like* vomer, and the bone is not "truncated at the anterior end"; and, moreover, the statement that "the lower larynx has not more than one pair of intrinsic muscles" is simply not true, but it is true that the morphology of the trachea and its associated parts, myology and all, are essentially very different indeed in Swifts and Humming-birds. Finally, he closes what he has to say about his "*Cypselomorphæ*" and their affinities without a single direct comparison between a Swift and a Humming-bird except that "the *Cypselidæ* are very closely related to the Swallows among the *Coracomorphæ*," in which statement I most emphatically agree with him.

The fact is Huxley, at the time he wrote his "Classification of Birds," had by no means Humming-bird material enough to judge by. He had more Swift-material, and this he compared with *four species* of Swallows and could not avoid being impressed by the evident resemblances, and so stated them. His material, however, would not justify him in taking

any other step at the time he wrote than to convert Nitzsch's "Macrochires" into his "Cypselomorphæ," plus the *Caprimulgi*—a group which Nitzsch had the wisdom to keep apart.

Sundevall (1872-74), in his 'Tentamen,' placed the Swifts in one "Cohors" and the Humming-birds in another, and this was seven years after Huxley wrote his Classification. Sundevall devoted his entire life to the science of ornithology; he wrote a complete classification of birds, which, though faulty in many particulars, was correct in others, and was based almost entirely upon the study of their *external* characters.

But we have a better man than Sundevall in Macgillivray, and there is good evidence that the latter made a very careful study of nearly the entire structure of at least one species of Humming-bird. He is probably responsible, too, for the classification set forth in Audubon's great work; and in that work the Swifts are placed near the Swallows and far asunder from the Humming-birds. Macgillivray was aware of the extraordinarily large heart in the *Trochili*, of the peculiarities in the tongue, in the gizzard, the feet ("proportionally as large as those of a Cormorant"), in the pterylosis, in the air-passages, and in many other parts.

Mr. William Brewster, of Cambridge, Mass., a very distinguished American ornithologist, believes "that a Swift is merely a peculiar kind of Swallow"*; Mr. Harting believes that "the relationship between the *Cypseli* and *Trochili* has been overstated, not to say exaggerated" (Ibis, 1893, p. 93); and I could mention a good many others holding the same opinion. But what such men *believe* is supported by those who have made life-long studies of the structure of birds—not only of their osteology, as Mr. Lucas has done, but of their myology, their embryology, their neurology, their pneumatology, their angiology, and everything else that relates to their biology. All these systems afford characters quite as good as those offered by the skeleton. Take such a man, for instance, as was Professor William Kitchen Parker (and the world has produced but very, very few men

* Amer. Nat., April 1893 p. 370.

like him): he clearly saw the relations existing among the birds we now have under consideration. A number of years ago Professor Parker read for me before the Linnean Society of London a memoir upon this subject (Linn. Soc. Journ. vol. xx.), and of it he was so good as to write me (Sept. 30, 1887) that he considered it "like Garrod's best work and mine [his] combined"; but in another letter he gave me an opinion of his which is far more important than that. This letter was of an earlier date*, and in it he wrote that "this fact remains—the only birds outside the huge group of the 5000 Coracomorphæ that have the *ægithognathous* palate are the Swifts: either they arose from the same stock as the Swallows, or they came from a type very nearly related,—and Newton says that the *Swallows* are a very isolated group of Passeres; yet they have many characters typical, inside and out." An opinion of that kind is not a "snap judgement," but is written by one who daily studied the relations of birds for *forty years*. Some day and in another place, perhaps, I propose to publish a series of Professor Parker's letters to myself that contain much of interest to ornithologists, and views that up to the time of his lamented death he had not committed to print.

So much for a few of the authorities that Mr. Lucas so earnestly seeks; and Dr. Fürbringer, in his work, can supply him with a number of others.

My critic believes that it is through *Chatura* that the Swifts have relations with the Humming-birds (p. 365), and yet holds me up for having uttered "sweeping generalizations based on the examination and comparison of a limited number of local forms" (p. 371). Now it was to the anatomy of *Chatura* that I paid especial attention in my Linnean memoir, and compared it in detail with the anatomy of several genera and species of Humming-birds; and I failed to find then, and do not see at this moment any great amount of structural resemblance between them.

* Dated from Crowland, Trinity Road, Upper Tooting, S.W., Feb. 9, 1887.

It is to be regretted that Mr. Lucas did not mention in his paper what Humming-bird among all the *Trochili* is so much like *Chætura*. When I have been informed upon that point I shall be in a position to see more clearly what my friend means from what he says. But, mark you, I am no longer inclined in this matter to listen to those who have only a few *single sets of characters* to bring forward in support of what they state. I have carefully examined the *entire anatomy* of several specimens of *Chætura pelagica*, as I have the structure of many Humming-birds; but to *use* the knowledge gained therefrom I must at least have the evidence that my opponent is equipped in a similar manner.

On p. 369 of his paper Mr. Lucas presents us with a series of figures (1-5) which are intended to show the "various steps in the transition from the humerus of the Goatsucker to that of the Humming-bird." The bones are right humeri seen upon their anconal aspects, and several of them have been more or less enlarged. They are from specimens of *Campylopterus hemileucurus*, *Cypselus apus*, *Macropteryx klecho*, *Chordeiles virginianus*, and *Progne subis*. The series, then, is from a Passerine to a Trochilidine bird more than it is from Goatsucker to Humming-bird. No descriptions nor actual comparisons whatever occur in the text of the article in regard to these bones—important matters about which we are left entirely in the dark. Glancing at the pictures of them as they stand, it must be evident to any one, osteologist or otherwise, that there are two instances in which violence has been done, and these are the insertion of the humeri of the Goatsucker and the Humming-bird in the series. But we are not after what things thus superficially "look like," but that better and far safer species of anatomy which takes into consideration the characters as they actually exist. Mr. Lucas, in conversation with me the other day, acknowledged that he thus far failed to see how it was that the humerus of a Humming-bird had come to be "completely twisted round." Permit me to suggest it may be just possible that it is

Mr. Lucas's taxonomy of the birds we have under consideration which is so completely twisted round, and not the Trochilidine humerus.

My apologies are due to those "few benighted ornithologists" alluded to in the first paragraph of my critic's paper. What I said about their views was prompted by an observation made by Professor Parker in his letter of February 9th (1887) referred to above. He remarked:—"Don't let us be in a hurry; it is a *give-and-take* business. In ornithotomy we come across things *deeper* than those seen and argued about by the mere ornithologist. Those of the latter group, *here*, are dead against the doctrine of Swifts being a kind of Swallow." But Professor Parker had a very good excuse for writing as he did; for in a letter written to me in September 1887 he says of himself that "the whole Class is always flitting and flying through my mind, so that you can't wonder at my being somewhat bird-witted, as the expression goes." And in the month preceding of the same year, or in August, he said:—"The Cypselidæ, although ægithognathous, I should set close to the Hirundinidæ, but *outside* the line, as the most Passerine of the utterly polymorphic Cuculines ('Coccygomorphæ'). The latter group is one-tenth the size of the Coracomorphæ, and ten times as variable. . . . I should make it begin with the Swifts and *end* with the Parrots."

Before closing this brief paper I desire to express my thanks to Mr. Lucas for the loan of a skeleton of *Collocalia*, for the skulls of *Macropteryx* and *Cypselus apus*, with some limb-bones of the last two, and for what he has written about them in 'The Ibis.' As he truly remarks, *Macropteryx* is a specially interesting form, and I would add that it is of the highest importance to avian classification that the anatomy of all the Swifts and Swift-like birds now retained by ornithologists in that group should be thoroughly examined. The fact that *Macropteryx mystacea* apparently lacks basipterygoid processes, but has the mandible in one piece like the (*Cypseli*, must be remembered in connection with Huxley's observation—"The modification commenced in the Swift is

greatly exaggerated in *Ægotheles* and *Caprimulgus*; while we have almost a transition to the desmognathous structure in *Nyctibius*" (P. Z. S. 1867, p. 456). In connection with this latter fact remember, too, that the *Striges* are desmognathous, and that such a form as *Steatornis* exists. Then the pterylosis of many of the *Caprimulgi* has an *owlish pattern* that means something. Remember, too, *Megascops* has two "colour-phases," so have some *Caprimulgi*; *Megascops* and some other Owls have "plumicorns," and so have some *Caprimulgi*; most Owls are nocturnal, so are many Goat-suckers; and so we might go on, carrying the comparison far into the fields of anatomy. Do not allow too much zeal in one quarter to mask the facts in another.

AVES are a wonderfully closely-clustered group of Vertebrates, and it is extremely difficult to get at their affinities and inter-relationships. They will classify themselves to a large extent when the *anatomy* of four-fifths of the forms, including that of all the "outliers," is known to us; and only when that is done and accomplished shall we be in a position to define their affinities correctly and to make a classification of them—not before. More material, and of the right kind, is what we need now, and its careful and thorough working-up. In my opinion no classification of birds has been published since the days of Linnæus that must not be considered, in many of its parts, wholly provisional. Until further progress has been made it is, I think, very questionable whether any material service to ornithology is rendered by persistently propounding the new systems of avian taxonomy with which we are now often afflicted.

IV.—On the Birds of the Calcutta District.

By PHILIP W. MUNN, M.B.O.U.

THE following notes were made during a residence of several years at Titaghur, on the Hooghly, about twelve miles north of Calcutta, and one mile south of Barrackpore. Though they chiefly relate to the birds noticed in the neighbourhood